



Assessment of carbon pools in two soils from the Campania region (Southwest, Italy) under different forest types

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Soil is the largest carbon reservoir of terrestrial ecosystems, this reservoir is not inert, but it is constantly in a dynamic phase of accumulation and depletion.

After the addition, in the soil, of organic residues of different origin and nature, two processes can occur in charge of SOM (Soil Organic Matter) during the pedogenesis: mineralization and humification. The accumulation of SOM in soil is controlled by the balance between carbon inputs and losses through mineralization and/or leaching. In particular the humification process leads to the formation of organic compounds (in some cases even complex organo-mineral) chemically stable able to distribute itself in the soil second rules of site-specific pedogenesis. The transport process along the profile can take very different forms which may extend in the formation of Bh horizons of accumulation in depth also strongly cemented (so-called ortstein).

The transport process along the profile occurs for the occurrence of certain conditions such as deposition of high amounts of organic residues on the top of the profile, high porosity of the soil for the presence of coarse solid fractions (coarse sands or skeleton) that determinate a strong infiltrating capacity of the circulating waters, extreme temperatures can slow or stop the process of mineralization and/or humification in one intermediate step of the degradation process releasing organic metabolites with high or medium solubility and high loads of percolating water related to intense rainfall.

The nature of the forest cover influence the quantity and quality of the organic materials deposited with marked differences between coniferous and deciduous especially in relation to resistance to degradation and production of intermediate metabolites.

Two soils from Campania region located in Monte Santa Croce (Caserta, Italy) with andic properties, different forest cover (pine and chestnut) and that meets the requirements of the place and pedological formation suitable for the formation and accumulation of SOM in depth (Bh horizon) were studied.

The content of the different soil C fractions was assessed for each soil profile and included: total extractable C, (TEC), total organic C (TOC), total extractable lipids (TEL), humified C (humic and fulvic acids, HA & FA) and non humic C (NHC), lignin C, cellulose C. Also were calculated parameters of humification, humification degree (DH), humification rate (HR), total level of humification (HU) and humification index (HI)

The results are discussed in terms of how soil use and vegetation influences the identified C pools, and the humification indexes.